



**DEFENSE LOGISTICS AGENCY  
DEFENSE NATIONAL STOCKPILE CENTER  
8725 JOHN J. KINGMAN ROAD, SUITE 3229  
FT. BELVOIR, VIRGINIA 22060-6223**



IN REPLY

REFER TO **DNSC-C2**

**July 27, 2004**

**AMENDMENT NUMBER 007  
TO  
SOLICITATION OF OFFERS DLA-MANGANESE,  
METALLURGICAL, CHEMICAL AND DIOXIDE BATTERY GRADES-002**

The above referenced Solicitation of Offers, DLA- MANGANESE METALLURGICAL, CHEMICAL AND DIOXIDE SYNTHETIC BATTERY GRADES, dated June 17, 2003, is hereby amended to offer MANGANESE DIOXIDE NATURAL BATTERY GRADE for sale.

1. Reference to solicitation of offers, DLA-MANGANESE METALLURGICAL, CHEMICAL AND DIOXIDE SYNTHETIC BATTERY GRADES 002 is hereby amended and should read DLA-MANGANESE, METALLURGICAL, CHEMICAL AND DIOXIDE SYNTHETIC & NATURAL BATTERY GRADES-002.
2. Under Section A – Solicitation, Paragraph A.1 Introduction (SEP 02), delete Subparagraph a. and substitute it with the following:
  - a. The Defense Logistics Agency (DLA), Defense National Stockpile Center (DNSC), is soliciting offers for the sale of approximately 1,364 SDT of Manganese Dioxide, Synthetic Battery Grade and 4,509 SDT of Manganese Dioxide, Natural Battery Grade under DLA-MANGANESE, METALLURGICAL, CHEMICAL AND DIOXIDE SYNTHETIC & NATURAL BATTERY GRADES-002. Starting August 9, 2004, offers may be submitted daily. Offers must be received at the address in Section B.2.a. by 2:00 pm, local time, Ft. Belvoir, VA. In the event DNSC is closed at the time set, offers will be received at 2:00 p.m., local time, Ft. Belvoir, VA on the next DNSC business day.
3. Under Section A - Solicitation, Paragraph A.2 Description (JAN 95), add the following to Subparagraph a:

The Manganese, Battery Natural Grade is stored in bulk piles. The origin is domestic. The MN02 ranges from a low of 58.21% to a high of 70.22%. The material is being offered from the DNSC Ravenna Depot, Ravenna, OH.
4. Under Section C – Inspection (SEP 02), add the following Paragraph 5:

Offerors, or their designees, are invited at their expense to inspect and sample the material prior to submitting an offer. The sample size is not to exceed fifty pounds (50) pounds per offeror.

5. Under Section I – Submittals, add I.2a, Item Offer Page – Manganese Dioxide, Natural Battery Grade (AUG 04).
6. Under Section J, add the following J.I.b, Description of Analysis (AUG 04) for Manganese Dioxide, Natural Battery Grade, copy attached.
7. Under Section J, add the following to J.3.b, Storage Location (AUG 04), copy attached.
8. Under Section J, add the following to J.4.a, Material Safety Data Sheet for Manganese Dioxide, Natural Battery Grade, copy attached.

Offerors shall acknowledge receipt of this Amendment by signing in the space provided below. Failure to acknowledge receipt of this Amendment may result in an offeror being ineligible for award. Except as provided herein, all other terms and conditions of DLA-MANGANESE METALLURGICAL, CHEMICAL AND DIOXIDE, SYNTHETIC & NATURAL BATTERY GRADES-002 remain unchanged and in full force and effect. If additional information is needed on the sale of Manganese please contact Mr. Kenrick Sawh at (703) 767-5483 or e-mail address, [kenrick.sawh@dla.mil](mailto:kenrick.sawh@dla.mil).

NAME OF FIRM \_\_\_\_\_

ADDRESS \_\_\_\_\_

TELEPHONE \_\_\_\_\_

FACSIMILE and Email \_\_\_\_\_

COMPLETED By and TITLE \_\_\_\_\_

SIGNATURE and DATE \_\_\_\_\_

DLA – MANGANESE DIOXIDE BATTERY GRADE NATURAL-002  
I.2.a SHOPPING LIST (AUG 04)

Item	Location	Pile	Grade	Net Weight (SDT)	Origin	Unit Price Per SDT	Quantity (SDT)	Total Offer Price
14	Ravenna, OH	11	B	1,310.22	Domestic	\$		\$
15	Ravenna, OH	11A	B	513.29	Domestic	\$		\$
16	Ravenna, OH	11C	B	355.00	Domestic	\$		\$
17	Ravenna, OH	11D	B	279.41	Domestic	\$		\$
18	Ravenna, OH	11E	B	394.42	Domestic	\$		\$
19	Ravenna, OH	11F	B	416.99	Domestic	\$		\$
20	Ravenna, OH	11G	B	494.00	Domestic	\$		\$
21	Ravenna, OH	11H	B	455.00	Domestic	\$		\$
22	Ravenna, OH	11I	B	291.13	Domestic	\$		\$
23	Ravenna, OH	11J	B	280.98	Domestic	\$		\$
24	Ravenna, OH	11K	B	543.00	Domestic	\$		\$
25	Ravenna, OH	11L	B	516.00	Domestic	\$		\$
26	Ravenna, OH	11M	B	319.93	Domestic	\$		\$
27	Ravenna, OH	11N	B	320.97	Domestic	\$		\$
28	Ravenna, OH	11O	B	333.94	Domestic	\$		\$
29	Ravenna, OH	11R	B	160.01	Domestic	\$		\$
30	Ravenna, OH	11T	B	372.99	Domestic	\$		\$
31	Warren, OH	1	B	18,540.80	Domestic	\$		\$
32	Warren, OH	2	B	1,082.56	Domestic	\$		\$
<b>Total:</b>				<b>26,980.64</b>				

**NOTE: ITEM 32 - PILE 2 AT WARREN, OH HAS SOME DIRT CONTAMINATION. IT IS STRONGLY SUGGESTED THAT ALL POTENTIAL BIDDERS VISIT THE STORAGE SITE TO INSPECT AND SAMPLE THIS MATERIAL BEFORE SUBMITTING AN OFFER.**

DLA – MANGANESE DIOXIDE BATTERY GRADE NATURAL -002  
J.1.b ANALYSIS (AUG 04)

[illegible]

DLA – MANGANESE DIOXIDE BATTERY GRADE NATURAL -002  
J.3.b STORAGE LOCATIONS (AUG 04)

Location	Operational Status	Days	Hours	Accessibility	Responsible Depot	Depot Manager
Ravenna, OH	Un-Staffed	Monday - Friday	0800 - 1430	Truck /	Warren, OH	John Pittano Phone: (330) 652-1456
<b>Note 1:</b> Prior arrangements must be made before shipping. <b>Note 2:</b> This location is a secure site and D.O.D security regulations apply.						<b>Storage Specialist</b> Andrew Johnson Leon Morrison Sally Tryon Phone: (330) 652-1456

**Point of Contact**

Defense Logistics Agency  
Defense National Stockpile Center  
Attn: Robert Clark  
8725 John J Kingman Road, Suite 3229  
Fort Belvoir, VA 22060-6223

Telephone Number: (703) 767-7614  
Facsimile Number: (703) 767-7608



# MATERIAL SAFETY DATA SHEET

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## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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**DEFENSE LOGISTICS AGENCY  
DEFENSE NATIONAL STOCKPILE CENTER  
8725 JOHN J. KINGMAN ROAD  
SUITE 3339  
FORT BELVOIR, VA 22060-6223**

**EMERGENCY TELEPHONE NUMBER:  
1-800-424-9300 (NORTH AMERICA)  
1-703-527-3887 (INTERNATIONAL)**

**SUBSTANCE: MANGANESE DIOXIDE, NATURAL**

**TRADE NAMES/SYNONYMS:**

MANGANESE OXIDE; MANGANESE SUPEROXIDE; MANGANESE BLACK; BLACK MANGANESE OXIDE; BOG MANGANESE; CEMENT BLACK; MANGANESE BINOXIDE; MANGANESE PEROXIDE; PYROLUSITE BROWN; MANGANESE OXIDE (MnO<sub>2</sub>); MANGANESE DIOXIDE; MANGANESE (IV) OXIDE; MnO<sub>2</sub>; 00229894; RTECS OP0350000

**CHEMICAL FAMILY:** metal oxides

**CREATION DATE:** May 27 2003

**REVISION DATE:** Mar 18 2004

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## 2. COMPOSITION, INFORMATION ON INGREDIENTS

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**COMPONENT:** MANGANESE DIOXIDE

**CAS NUMBER:** 1313-13-9

**EC NUMBER (EINECS):** 215-202-6

**EC INDEX NUMBER:** 025-001-00-3

**PERCENTAGE:** 100

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## 3. HAZARDS IDENTIFICATION

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**NFPA RATINGS (SCALE 0-4):** HEALTH=2 FIRE=0 REACTIVITY=0

**EMERGENCY OVERVIEW:**

**COLOR:** gray, brown or black

**PHYSICAL FORM:** solid or powder

**ODOR:** odorless

**MAJOR HEALTH HAZARDS:** skin irritation, eye irritation, nerve damage

**PHYSICAL HAZARDS:** Strong oxidizer. May ignite combustibles.



**POTENTIAL HEALTH EFFECTS:****INHALATION:****SHORT TERM EXPOSURE:** irritation, metal fume fever, lung damage**LONG TERM EXPOSURE:** loss of appetite, headache, difficulty speaking, sleep disturbances, mood swings, loss of coordination, hearing loss, visual disturbances, lung damage, blood disorders, kidney damage, nerve damage**SKIN CONTACT:****SHORT TERM EXPOSURE:** irritation**LONG TERM EXPOSURE:** irritation**EYE CONTACT:****SHORT TERM EXPOSURE:** irritation**LONG TERM EXPOSURE:** irritation**INGESTION:****SHORT TERM EXPOSURE:** nausea, vomiting, diarrhea**LONG TERM EXPOSURE:** loss of appetite, headache, difficulty speaking, sleep disturbances, mood swings, loss of coordination, hearing loss, visual disturbances, lung damage, blood disorders, kidney damage, nerve damage**CARCINOGEN STATUS:****OSHA:** No**NTP:** No**IARC:** No

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**4. FIRST AID MEASURES**

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**INHALATION:** If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. Get immediate medical attention.**SKIN CONTACT:** Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.**EYE CONTACT:** Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.**INGESTION:** If a large amount is swallowed, get medical attention.**ANTIDOTE:** calcium disodium edetate/dextrose, intravenous; calcium disodium edetate/procaine, intramuscular.

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**5. FIRE FIGHTING MEASURES**

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**FIRE AND EXPLOSION HAZARDS:** Negligible fire hazard. Oxidizer. May ignite or explode on contact with combustible materials.**EXTINGUISHING MEDIA:** water

Large fires: Flood with water. Apply water from a protected location or from a safe distance.

**FIRE FIGHTING:** Move container from fire area if it can be done without risk. Cool containers with

water spray until well after the fire is out. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Flood with water. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Avoid inhalation of material or combustion by-products. Evacuate if fire gets out of control or containers are directly exposed to fire. Evacuation radius: 800 meters (1/2 mile).

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## 6. ACCIDENTAL RELEASE MEASURES

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### **OCCUPATIONAL RELEASE:**

Avoid contact with combustible materials. Do not touch spilled material. Small dry spills: Move containers away from spill to a safe area. Small liquid spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Large spills: Dike for later disposal. Keep unnecessary people away, isolate hazard area and deny entry.

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## 7. HANDLING AND STORAGE

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**STORAGE:** Store and handle in accordance with all current regulations and standards. NFPA 430 Code for the Storage of Liquid and Solid Oxidizing Materials. Keep separated from incompatible substances.

**HANDLING:** Use methods to minimize dust.

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## 8. EXPOSURE CONTROLS, PERSONAL PROTECTION

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### **EXPOSURE LIMITS:**

#### **MANGANESE DIOXIDE, NATURAL:**

#### **MANGANESE AND COMPOUNDS (as Mn):**

5 mg/m<sup>3</sup> OSHA ceiling (metal) (fume) (compounds)

1 mg/m<sup>3</sup> OSHA TWA (particulate) (vacated by 58 FR 35338, June 30, 1993)

3 mg/m<sup>3</sup> OSHA STEL (particulate) (vacated by 58 FR 35338, June 30, 1993)

0.2 mg/m<sup>3</sup> ACGIH TWA (metal and inorganic compounds)

1 mg/m<sup>3</sup> NIOSH recommended TWA 10 hour(s) (metal) (fume) (compounds)

3 mg/m<sup>3</sup> NIOSH recommended STEL (metal) (fume) (compounds)

0.5 mg/m<sup>3</sup> DFG MAK (peak limitation category - I, with excursion factor of 1) (inhalable fraction) (metal and inorganic compounds)

1 mg/m<sup>3</sup> UK OES TWA (metal) (fume) (Chemical Hazard Alert Notice issued)

5 mg/m<sup>3</sup> UK OES TWA (compounds) (Chemical Hazard Alert Notice issued)

3 mg/m<sup>3</sup> UK OES STEL (metal) (fume) (Chemical Hazard Alert Notice issued)

0.5 mg/m<sup>3</sup> UK MEL TWA (metal and inorganic compounds)

**MEASUREMENT METHOD:** Particulate filter; Acid; Inductively coupled plasma; NIOSH IV # 7300, Elements

**VENTILATION:** Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits.

**EYE PROTECTION:** Wear splash resistant safety goggles with a faceshield. Provide an emergency

eye wash fountain and quick drench shower in the immediate work area.

**CLOTHING:** Wear appropriate chemical resistant clothing.

**GLOVES:** Wear appropriate chemical resistant gloves.

**RESPIRATOR:** The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA.

Measurement Element:

Manganese (Mn)

**10 mg/m<sup>3</sup>**

Any dust and mist respirator except single-use and quarter-mask respirators.

Any supplied-air respirator.

**25 mg/m<sup>3</sup>**

Any supplied-air respirator operated in a continuous-flow mode.

Any powered, air-purifying respirator with a dust and mist filter.

**50 mg/m<sup>3</sup>**

Any air-purifying respirator with a full facepiece and a high-efficiency particulate filter.

Any supplied-air respirator with a tight-fitting facepiece that is operated in a continuous-flow mode.

Any powered, air-purifying respirator with a tight-fitting facepiece and a high-efficiency particulate filter.

Any self-contained breathing apparatus with a full facepiece.

Any supplied-air respirator with a full facepiece.

**500 mg/m<sup>3</sup>**

Any supplied-air respirator operated in a pressure-demand or other positive-pressure mode.

**Escape -**

Any air-purifying respirator with a full facepiece and a high-efficiency particulate filter.

Any appropriate escape-type, self-contained breathing apparatus.

**For Unknown Concentrations or Immediately Dangerous to Life or Health -**

Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.

Any self-contained breathing apparatus with a full facepiece.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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**PHYSICAL STATE:** solid

**COLOR:** gray, brown or black

**PHYSICAL FORM:** solid or powder

**ODOR:** odorless

**MOLECULAR WEIGHT:** 86.94

**MOLECULAR FORMULA:** Mn-O<sub>2</sub>

**BOILING POINT:** Not applicable

**MELTING POINT:** Not available

**DECOMPOSITION POINT:** 995 F (535 C)

**VAPOR PRESSURE:** Not applicable

**VAPOR DENSITY:** Not applicable

**SPECIFIC GRAVITY:** Not available

**DENSITY:** 5.026 g/cc

**WATER SOLUBILITY:** insoluble

**PH:** Not applicable

**VOLATILITY:** Not applicable

**ODOR THRESHOLD:** Not available

**EVAPORATION RATE:** Not applicable

**COEFFICIENT OF WATER/OIL DISTRIBUTION:** Not available

**SOLVENT SOLUBILITY:**

**Insoluble:** nitric acid, sulfuric acid, acetone

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## 10. STABILITY AND REACTIVITY

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**REACTIVITY:** Stable at normal temperatures and pressure.

**CONDITIONS TO AVOID:** Avoid contact with combustible materials. May ignite or explode on contact with combustible materials. Keep out of water supplies and sewers.

**INCOMPATIBILITIES:** metals, oxidizing materials, halogens, acids, peroxides, reducing agents, amines, combustible materials, metal carbide, bases

**MANGANESE DIOXIDE:**

**ALUMINUM:** Violent reaction when heated.

**ANILINIUM PERCHLORATE:** Explodes.

**BARIUM CHLORATE:** May explode.

**CALCIUM CHLORATE:** May explode.

**CALCIUM HYDRIDE:** Incandesces when warmed.

**CHLORATES:** May explode.

**CHLORINE TRIFLUORIDE:** Incandescent reaction.

**COMBUSTIBLE MATERIALS:** May increase the burning rate or cause ignition on contact; contact with finely divided materials may result in an explosion.

**DIBORON TETRAFLUORIDE:** Violent reaction at 15 C.

**HYDROCHLORIC ACID:** Releases chlorine fumes.

**HYDROGEN PEROXIDE:** May explode.

**HYDROGEN SULFIDE:** May ignite.

**HYDROXYLAMINIUM CHLORIDE (20% SOLN):** Vigorous reaction.

**HYPOPHOSPHITES:** Fire and explosion hazard.

**ORGANIC MATERIALS:** May increase the burning rate or cause ignition on contact; finely divided materials may result in an explosion.

**PERMONOSULFURIC ACID (92%):** Explosive decomposition.

**PHOSPHIDES:** Fire and explosion hazard.

**POTASSIUM AZIDE:** Violent reaction when heated.

**REDUCING MATERIALS:** Fire and explosion hazard.

**RUBIDIUM CARBIDE:** Incandescent reaction at 350 C.

**SODIUM PEROXIDE:** Violent decomposition.

**SULFIDES:** Fire and explosion hazard.

**SULFUR:** Fire and explosion hazard.

**HAZARDOUS DECOMPOSITION:**

Thermal decomposition products: oxides of manganese

**POLYMERIZATION:** Will not polymerize.

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## 11. TOXICOLOGICAL INFORMATION

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### **MANGANESE DIOXIDE, NATURAL:**

#### **TOXICITY DATA:**

>3478 mg/kg oral-rat LD50; 50 mg/kg intratracheal-rat LDLo; 422 mg/kg subcutaneous-mouse LD50; 45 mg/kg intravenous-rabbit LDLo; 1800 ug/m<sup>3</sup>/24 hour(s)-35 day(s) continuous inhalation-rat TCLo; 21 ug/m<sup>3</sup>/5.3 year(s) intermittent intramuscular-human TDLo; 6000 mg/kg/12 day(s) intermittent subcutaneous-mouse TDLo; 150 mg/kg/3 week(s) intermittent subcutaneous-monkey TDLo; 7 mg/m<sup>3</sup>/24 hour(s)-34 week(s) continuous inhalation-rat TCLo; 0.6 mg/m<sup>3</sup>/1 hour(s)-17 week(s) intermittent inhalation-monkey TCLo

#### **LOCAL EFFECTS:**

Irritant: skin, eye

**ACUTE TOXICITY LEVEL:** Insufficient Data.

**TARGET ORGANS:** nervous system

#### **REPRODUCTIVE EFFECTS DATA:**

49 mg/m<sup>3</sup> inhalation-mouse TCLo/7 hour(s) 75 day(s) pre pregnancy/1-18 day(s) pregnant female continuous

### **HEALTH EFFECTS:**

#### **INHALATION:**

MANGANESE DIOXIDE: See information on metal fume fever and manganese compounds.

#### **ACUTE EXPOSURE:**

**METAL FUME FEVER:** Metal fume fever, an influenza-like illness, may occur due to the inhalation of freshly formed metal oxide particles sized below 1.5 microns and usually between 0.02-0.05 microns. Symptoms may be delayed 4-12 hours and begin with a sudden onset of thirst, and a sweet, metallic or foul taste in the mouth. Other symptoms may include upper respiratory tract irritation accompanied by coughing and a dryness of the mucous membranes, lassitude and a generalized feeling of malaise. Fever, chills, muscular pain, mild to severe headache, nausea, occasional vomiting, exaggerated mental activity, profuse sweating, excessive urination, diarrhea and prostration may also occur. Tolerance to fumes develops rapidly, but is quickly lost. All symptoms usually subside within 24-36 hours.

MANGANESE COMPOUNDS: No data available.

#### **CHRONIC EXPOSURE:**

**METAL FUME FEVER:** There is no form of chronic metal fume fever, however, repeated bouts with symptoms as described above are quite common. Resistance to the condition develops after a few days of exposure, but is quickly lost in 1 or 2 days.

**MANGANESE COMPOUNDS:** Repeated or prolonged exposure to manganese compounds may result in systemic poisoning known as "manganism", a Parkinsonian-like syndrome. It is characterized initially by anorexia, asthenia, headache, insomnia or somnolence, irritability, restlessness, and spasm or pain in the muscles. Manganese psychosis may follow with uncontrollable behavior, unaccountable laughing or crying, visual hallucinations, confusion and euphoria. Sexual excitement followed by impotence may occur. These symptoms may disappear with the onset of true neurological manifestations of slow, slurred and irregular speech, monotonous tone, double vision, impaired hearing, difficulty with fine motor movements, and disturbances in gait and balance with frequent propulsion or retropulsion. Mask-like face, decreased movement of the eyelids and eyes and tremors of the upper extremities and head may also occur. Other signs and symptoms may include urinary bladder disturbances, excessive salivation and sweating, hematological changes, vasomotor disorders, decreased pulmonary function, kidney and possibly liver damage. Removal from exposure shortly after onset of symptoms usually

results in improvement, although there may be residual disturbances in gait and speech. Once manganism is well established it becomes irreversible and progressive, but not fatal. An increased incidence of bronchitis and pneumonitis has been reported in studies of workers exposed to manganese dust and fume, and although these effects have been confirmed by animal experiments, they may represent an aggravation of a pre-existing condition. Allergic diseases of the respiratory tract have also been reported in one study.

**SKIN CONTACT:****ACUTE EXPOSURE:**

MANGANESE DIOXIDE: May cause irritation with redness and pain.

**CHRONIC EXPOSURE:**

MANGANESE DIOXIDE: Repeated or prolonged contact may cause dermatitis.

**EYE CONTACT:****ACUTE EXPOSURE:**

MANGANESE DIOXIDE: May cause redness, pain, tearing and irritation.

**CHRONIC EXPOSURE:**

MANGANESE DIOXIDE: Repeated or prolonged contact may cause conjunctivitis.

**INGESTION:**

MANGANESE DIOXIDE: See information on manganese compounds.

**ACUTE EXPOSURE:**

MANGANESE COMPOUNDS: Ingestion of extremely large doses of manganese compounds may cause gastrointestinal irritation, resulting in nausea, vomiting, and diarrhea, so that less is available for absorption.

**CHRONIC EXPOSURE:**

MANGANESE COMPOUNDS: Manganese poisoning, as described in chronic inhalation, has been reported in persons drinking manganese-contaminated well water.

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## 12. ECOLOGICAL INFORMATION

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Not available

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## 13. DISPOSAL CONSIDERATIONS

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Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.

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## 14. TRANSPORT INFORMATION

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**U.S. DEPARTMENT OF TRANSPORTATION:** No classification assigned.

**CANADIAN TRANSPORTATION OF DANGEROUS GOODS:** No classification assigned.

**LAND TRANSPORT ADR:** No classification assigned.

**LAND TRANSPORT RID:** No classification assigned.

**AIR TRANSPORT IATA:** No classification assigned.

**AIR TRANSPORT ICAO:** No classification assigned.

**MARITIME TRANSPORT IMDG:** No classification assigned.

## 15. REGULATORY INFORMATION

### U.S. REGULATIONS:

**CERCLA SECTIONS 102a/103 HAZARDOUS SUBSTANCES (40 CFR 302.4):** Not regulated.

**SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.30):**  
Not regulated.

**SARA TITLE III SECTION 304 EXTREMELY HAZARDOUS SUBSTANCES (40 CFR 355.40):**  
Not regulated.

**SARA TITLE III SARA SECTIONS 311/312 HAZARDOUS CATEGORIES (40 CFR 370.21):**

ACUTE: Yes

CHRONIC: Yes

FIRE: Yes

REACTIVE: No

SUDDEN RELEASE: No

**SARA TITLE III SECTION 313 (40 CFR 372.65):**  
**MANGANESE AND COMPOUNDS (as Mn)**

**OSHA PROCESS SAFETY (29CFR1910.119):** Not regulated.

### STATE REGULATIONS:

**California Proposition 65:** Not regulated.

### CANADIAN REGULATIONS:

**WHMIS CLASSIFICATION:** Not determined.

### EUROPEAN REGULATIONS:

**EC CLASSIFICATION (ASSIGNED):**

Xn	Harmful
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EC Classification may be inconsistent with independently-researched data.

**DANGER/HAZARD SYMBOL:**

**Xn****EC RISK AND SAFETY PHRASES:**

R 20/22	Harmful by inhalation and if swallowed.
S 2	Keep out of reach of children.
S 25	Avoid contact with eyes.

**GERMAN REGULATIONS:****WATER HAZARD CLASS (WGK):****STATE OF CLASSIFICATION:** Annex 3**CLASSIFICATION UNDER HAZARD TO WATER:** 1**NATIONAL INVENTORY STATUS:****U.S. INVENTORY (TSCA):** Listed on inventory.**TSCA 12(b) EXPORT NOTIFICATION:** Not listed.

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**16. OTHER INFORMATION**

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**MSDS SUMMARY OF CHANGES****11. TOXICOLOGICAL INFORMATION**

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